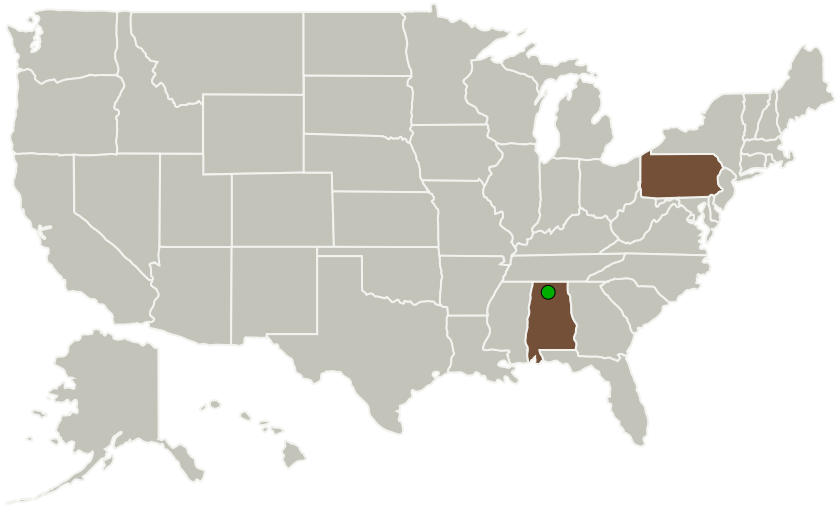
Refractory Coated/Lined Low Density Structures, Phase I

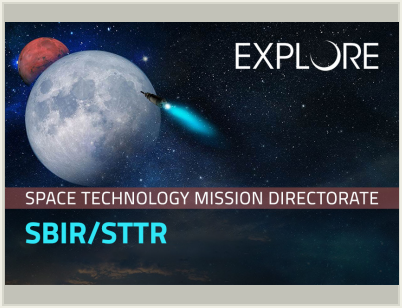
Completed Technology Project (2010 - 2010)

Project Introduction

The innovation in this proposed effort is the development of refractory coated or lined low density structures. Lightweight structures are desirable for space transportation vehicle systems in order to reduce launch costs, increase mission flexibility/efficiency, and add robustness with respect to the ability to add weight or additional materials to the mission with minimum sacrifice in performance. The use of thin refractory coatings over low density structures will yield a lightweight alternative to current solid monolithic components. Thus, offering an increase in mission flexibility by allowing greater speeds, greater range, and bigger payloads. Additional studies will be conducted to seek materials that offer higher temperature use, lower weight, and lower cost. The higher maximum temperatures may eliminate the need for cooling air, while simultaneously increasing engine efficiency. These benefits result in increased fuel savings. The advanced materials study will include refractory metals and ceramics. The manufacturing processes for the monolithic ceramics and refractory metal materials will include vacuum plasma spraying (VPS) and EL-Form electrodeposition.

Primary U.S. Work Locations and Key Partners





Refractory Coated/Lined Low Density Structures, Phase I

Table of Contents

Refractory Coated/Lined Low Density Structures, Phase I

Completed Technology Project (2010 - 2010)

Organizations Performing Work	Role	Type	Location
Materials Research and Design, Inc.	Lead Organization	Industry	Wayne, Pennsylvania
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Pennsylvania

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140036)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Materials Research and Design, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joseph H Pluscauskis

Co-Investigator:

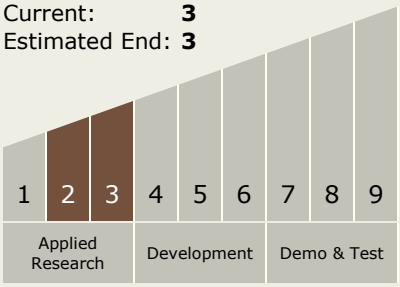
Joseph Pluscauskis

Refractory Coated/Lined Low Density Structures, Phase I

Completed Technology Project (2010 - 2010)

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.4 Solids

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System